NOAA Climate Test Bed

Improved Extended-Range Prediction through a Bayesian Approach: Exploiting the Enhanced Predictability Offered by the Madden-Julian Oscillation

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Abstract

We propose to implement a Bayesian framework in a Multi-Model Ensemble (MME) approach for the purpose of enhancing current NCEP/CPC products, such as the operational extended-range predictions (6-10-day, 8-14-day, and Weeks 3-4) over North America. In particular, we plan to exploit the potential enhanced predictability in the mid- to high-latitudes associated with the Madden-Julian Oscillation (MJO). The proposed Bayesian framework provides a means of building a bridge between the statistical relationships uncovered in previous studies and recent advances in dynamical forecast models that are heavily used in operational CPC forecasts. The primary purpose of our proposed project is twofold: (1) to extend our knowledge on the geographical areas and lead times for which the MJO may offer enhanced predictability, and (2) to transition that knowledge to enhance operational NCEP/CPC forecast products focusing on circulation changes related to MJO-variability. We expect that these enhanced climate forecast products will directly benefit a wide range of user communities.